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FURTHER REMARKS ON PARASITES FROM
THE HORSE AND ELEPHANT, WITH A
NOTICE OF NEW AMPHISTOMES FROM
THE OX.

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I HAD barely corrected and returned the proof of my previous paper on this subject when I received another set of entozoa from India. In accordance with the promise quoted at page 742, Lieut.-Colonel Hawkes had promptly transmitted a small phial containing amphistomes from the ox. They arrived on the 29th of September, and were labelled as having been "found in the intestines only." The specimens are sixty in number. All of them have a more or less shrivelled appearance and show greater variation in size and aspect than any of those previously received. This is neither the place nor occasion to offer minute comparisons between the different species of amphistomes in general, but, so far as my observations have extended, I feel bound to say that the study of this curious group of parasites is one of great difficulty, supposing the intention of the observer be to define the various species. Since the monographs of the learned Diesing appeared, some thirty-five years ago (and before that *savant* lost his sight), very little attention has been paid to the subject. The species run so closely together in character that it is hard to draw any sharp lines of demarcation between one form and another. From the materials already in my possession I hope ere long to offer a more strictly scientific account of the several forms already indicated as new to science; but in the meantime I am concerned only or chiefly to enumerate these forms with their habitats and to dwell upon the practical bearings of the subject. In addition to the two species announced in my last paper, namely, *Amphi-*

stoma Hawkesii and *A. Collinsii*, I have now in my possession the new series from the ox, and also another set from the horse. On the 14th ultimo (October) Professor Simonds placed in my hands a corked glass tube containing thirty-three worms of this genus. From one cause or another he had not drawn my attention to them before, but from this 'find' it now appears that Mr. Collins' discovery of equine amphistomes was anticipated by Mr. Edward Stanley, junr., who had, some five or six years back, sent the specimens to Mr. Simonds. They were forwarded from India during Mr. Stanley's residence in that country. It is worthy of remark that as regards size the amphistomes in question come much nearer to Lieut-Colonel Hawkes' masuri of the elephant than they do to Mr. Collins' specimens from the horse. Under any circumstances, however, the nomenclature already proposed must be provisionally allowed to stand, whether or not Mr. Stanley's amphistomes prove to be specifically distinct. Save in the matter of size such fine distinctions as are noticeable in the two sets of worms, when contrasted, appear to be almost entirely due to changes produced by the spirit in which they have been preserved. Therefore, regarding all these various Indian amphistomes as at best mere modifications of some original type form, it might be just as well to speak of them collectively by the native term of masuri. Thus, we have "masuri" from the horse, ox, and elephant, besides others from wild animals too numerous to mention. In the deer tribe they are very prevalent. Without insisting on the specific distinctness of the various forms that have now been either noticed or described, it will be useful, meanwhile, to draw up a list of those at present known to infest the more important quadrupeds. This catalogue may form a sort of point of departure for further special work in connection with the amphistomes infesting our domesticated animals. To the forms that I regard as doubtfully specific a mark of interrogation is appended.

1. The common amphistome (*A. conicum*, Rudolphi) infests the *rumen* of the bison, ox, zebu and all other varieties of cattle; also the sheep and gazelle, red deer, reindeer, roe, fallow and deer tribe generally.

2. Gurlt's pouched amphistome (*A. crumeniferum*, Creplin) infests the rumen of the zebu (?).

3. Gurlt's hepatic amphistome (*A. explanatum*, Creplin) infests the gall-bladder and hepatic duct of the zebu.

4. Hawkes' bovine amphistome (*A. tuberculata*, T. S. C.) infests the intestines of the ox.

5. Hawkes' masuri or amphistome (*A. Hawkesii*, T. S. C.) infests the intestines of the elephant.

6. Collins' amphistome (*A. Collinsii*, T. S. C.) infests the colon of the horse.

7. Stanley's amphistome (*A. Stanleyii*, T. S. C.) infests the colon of the horse. This is apparently nothing more than a large variety of the above (?).

8. Natterer's great amphistome (*A. giganteum*, Diesing) infests the cæcum of the peccary.

9. Natterer's rough amphistome (*A. asperum*, Diesing) infests the cæcum of the American tapir.

10. Natterer's pear-shaped amphistome (*A. pyriforme*, Diesing) infests the cæcum of the tapir.

11. The truncated amphistome (*A. truncatum*, Rud.) infests the stomach, liver-ducts, and intestine of seals. It was formerly described as infesting also the gall-bladder and hepatic ducts of the cat and the fox, but it appears that the supposed feline amphistome is only an ordinary fluke (*Distomat conus*, Creplin).

The above list suffices to show that these parasites are apt to infest a great variety of quadrupeds. As yet none have been found in the human body, but Diesing has described one from an American monkey obtained by Natterer in Brazil. Not improbably one or more species infest savages. Very little attention has hitherto been paid to the amphistomes by professional men, probably because these worms appear to be harmless. If the statements of the natives in India are worthy of credit, the presence of "masuri" in the intestines is a source of much irritation; and from the observation made by Mr. Collins it is clear that many hundreds, or it may be fully a thousand or more, of these parasites may exist in the colon of a single horse. From what we know of the behaviour of other intestinal worms that infest the cæcum and large intestines of the horse it is clearly the duty of the practitioner (should he be made aware of their presence in any animal under his charge) to expel them. For a long time past people have sought to ignore the important part played by internal parasites in the production of endemics and epizooty, but the time for doubting this rôle des entozoaires is at length gone by. Depend upon it, many a death, hitherto reported as resulting from inflammation of the intestines, colic, splenic apoplexy, sunstroke, or to some other obscure cause, has been primarily due to entozoa, the presence of which may not even have been suspected during life. Our amphistomes may be, and probably are, amongst

the least hurtful of the intestinal worms ; but, allowing this to be the case, that is in itself no valid reason for ignoring their existence altogether.

Lieut.-Colonel Hawkes, for example, loses no less than four-teen elephants in a space of little more than as many months. *Post-mortem* examinations are made with acknowledged care by skilful veterinary surgeons who attribute these deaths to eight distinct causes other than parasitic. Now, due regard being had to the fact that in every case in which Lieut.-Colonel Hawkes was present, flukes were found in the liver of these elephants (to say nothing of the masuri and soorti, the former of which species was also constantly present in the intestines), it does seem rather extraordinary that, in the reports, so many obscure causes of death should be indicated. Though long in practice as a physician dealing almost exclusively with internal parasitic diseases as they affect the human subject, I should be sorry to force my opinion with unbecoming zeal upon gentlemen who are daily taking charge of animal patients ; nevertheless, if they will take it good in part, I venture to say (as the result of some very remarkable experiences in human practice) that many patients are treated for diseases which, though produced by parasites, are not regarded as such either at the time the animals are under treatment or even after death. The true cause of the disorder is constantly overlooked. I state no more than the truth when I say that patients have come to me who have for years been treated for parasitic diseases when they never at any time had suffered from parasites ; whilst other cases have come under my notice which were treated for disorders not supposed to be entozoa in character when the real cause of their suffering was an internal parasite of some kind or other.

Again and again I have been asked by medical friends why the subject of parasites has been so much neglected. The answer is obvious. Until lately no one supposed that "worms" were so important. There is also another reason. At our medical colleges the students are required to get up a great variety of subjects for examination ; some of them, *me judice*, of far less importance, practically, than the study of parasites. Thus, though my colleagues at the Middlesex Hospital Medical College did all in their power to encourage the attendance of students at my lectures on parasites (to which they were admitted free of expense), the arduous character of their winter duties prevented any considerable number of the students from availing themselves of information which I had myself only obtained after years of sustained labour. Hereafter, in actual practice, these gentlemen will times

and oft feel the want of that special knowledge which I think it was in my power to have afforded them. I judge so by the demands that are frequently made upon me by medical men in practice. In this matter, thanks to the foresight and liberality of the Governors of the Royal Veterinary College, the veterinary department of the healing art has made a clear advance in its curriculum, and thus we hope that in course of time the real practical utility of a knowledge of parasites and parasitic diseases will be rendered more conspicuously apparent than it is at present. Forms of obscure entozoa that, like these amphistomes, seem little worthy of regard now, may yet turn out to be of very considerable importance.
